Be a Bug

Grade: 7-12

This lesson is designed for 7-12 grades. This lesson is a project by participants of a summer workshop at the Grant-Koshers Ranch.

Dan and Cheryl

Science standards:

Content Standard 1 – Students design, conduct, evaluate and communicate scientific investigations.

Content Standard 3 – Students demonstrate knowledge of characteristics, structures and function of living things, the process and diversity of life, and how living organisms interact with each other and their environment.

Content Standard 4 – Students demonstrate knowledge of the composition, structures, processes and interactions of Earth's systems and other objects in space.

Subjects: Science, English and Art

Duration: 5 class periods

Description: Students will study a common stream macroinvertebrate (insect)to gain knowledge about conditions in the stream and study a life form. This will involve conditions necessary for all life forms and specifically a caddisfly.

Goals:

1. Students will study basic stream dynamics.
2. Students will study the natural history of a caddisfly.

Background: A caddisfly is a common insect found in many streams of Montana. They have certain conditions that determine where they are found. By studying this common type of insect students will observe stream conditions and the factors that affect them.

Materials: Paper/pencil, Internet, insect guides, basic resource information

Stream monitoring equipment (nets, thermometers, water collecting jars or containers, meter sticks)

Activity:

You are a caddisfly. Through a mutation, you have gained human intelligence. When scientists were gathering aquatic samples to send to Mars for an aqua-forming program, you volunteered by jumping into a Hess sampler to be part of this endeavor. You need to communicate your needs first for the flight that will take over two years. And then communicate what you will need for your extended stay on Mars. What will you need to take along?

Teacher Note:

Brainstorm basic needs for all life forms with the class. Record and save this information. It will be needed later.

Students then need to find out about caddisflies. Insect guides, Internet and entomologists could be consulted. Keep this short initially. This should be basic information.

After students have an understanding about what a caddisfly is have them brainstorm again.

List out the original requirements and add new ideas. These should include a mate or more individuals and what stream conditions are necessary to maintain a population of caddisfly.

Divide the class into 2 groups.

One group will go out and sample a stream where caddisflies are found. (Check with your local fishing shop for locations if you are unsure.) For information on stream sampling techniques see www.epa.gov/owow/monitoring/volunteer/stream/ Have students record their information to share with the class later. (Data sheet attached)

Another group will research the natural history of the caddisfly. Again, have students record their information and the sources of that information. After both groups have completed their individual parts, bring them back together.

Data Sheet

Student Name _____ Date_____
Group_____

Test	Method	Location	Data
pH			
temperature			
turbidity			
depth			
stream flow			

Now, have students set up a program to maintain you (or your offspring) on the extended flight and stay on Mars. Student groupings could be variable depending on class dynamics. I would choose 2 from the stream monitoring group to work with 2 from the natural history group. Program should be written out in 1st person (you are the caddisfly!)

Programs should include what stream conditions are necessary, and natural history of caddisflies. Additionally include personal information about you (the caddisfly). Who are you? Do you have a name? Where do you live? Do you have a family? What do they look like? What are your needs?

Students will submit this program to each other for evaluation purposes. Have them share programs.

Student Name _____ Date_____
Group_____

Program:

Extension: Draw a family portrait and write a letter of goodbye